1 Distributions

Distribution	Bernoulli	Binomial	Geometric	Poisson	Exponential	Uniform	Normal
PDF	$\theta^x(1-\theta)^{1-x}$	$\binom{n}{k}\theta^k(1-\theta)^{n-k}$	$(1-\theta)^{x-1}\theta$	$\mathrm{e}^{-\lambda}\frac{\lambda^x}{x!}$	$\frac{1}{\lambda}\mathrm{e}^{\frac{-x}{\lambda}}$	$\frac{1}{b-a}$	$\frac{1}{\sqrt{2\pi\sigma^2}}\mathrm{e}^{\frac{-(x-\mu)^2}{2\sigma^2}}$
E[X]	θ	$n\theta$	$\frac{1}{\theta}$	λ	λ	$\frac{a+b}{2}$	μ
Var[X]	$\theta(1-\theta)$	$n\theta(1-\theta)$	$\frac{1-\theta}{\theta^2}$	λ	λ^2	$\frac{(b-a)^2}{12}$	σ^2

2 Hypothesis Testing

H_0	H_A	Test Statistic	Rejection Region
$\mu_1 = \mu_2$	$\mu_1 < \mu_2$	$\mathrm{Z} = \frac{(X_1-X_2)-(\mu_1-\mu_2)}{\sqrt{\sigma_1^2/n_1+\sigma_2^2/n_2}}$ (known σ)	$\mathrm{Z} < -\mathrm{z}_\alpha$
	$\mu_1 > \mu_2$		$\mathrm{Z} > \mathrm{z}_\alpha$
	$\mu_1 \neq \mu_2$		$\lvert\mathrm{Z}\rvert > \lvert\mathrm{z}_{\alpha/2}\rvert$
$\mu_1 = \mu_2$	$\mu_1 < \mu_2$	$\mathrm{t} = \frac{(X_1-X_2)-(\mu_1-\mu_2)}{\sqrt{s_1^2/n_1+s_2^2/n_2}}$ (unknown σ)	$\mathrm{t} < -\mathrm{t}_\alpha$
	$\mu_1 > \mu_2$		$\mathrm{t} > \mathrm{t}_\alpha$
	$\mu_1 \neq \mu_2$		$\lvert\mathrm{t}\rvert > \lvert\mathrm{t}_{\mathrm{n}-1,\alpha/2}\rvert$
$\pi_1 = \pi_2$	$\pi_1 < \pi_2$	$\mathrm{Z} = \frac{(\hat{\pi}_1-\hat{\pi}_2)-(\pi_1-\pi_2)}{\sqrt{\frac{\pi_1(1-\pi_1)}{n_1}+\frac{\pi_2(1-\pi_2)}{n_2}}}$	$\mathrm{Z} < -\mathrm{z}_\alpha$
	$\pi_1 > \pi_2$		$\mathrm{Z} > \mathrm{z}_\alpha$
	$\pi_1 \neq \pi_2$		$\lvert\mathrm{Z}\rvert > \lvert\mathrm{z}_{\alpha/2}\rvert$